

Study of Factors Causing Time and Cost Overrun in Pre-Construction Project (A Case Study of Malaysia)

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Abstract

Cost and time overrun are the key troubles of any improvement ventures. These troubles are inflicting the terrible end result in the development of kingdom monetary improvement and thriving. To overcome these problems, the paper examines predominant impact on elements causing the mission postponement and cost. A poll review was led for the situation study embracing various information-gathering procedures. The discoveries from the contextual investigation uncovered that the most persuasive factors in Malaysia: 1) contractor's inappropriate arranging, 2) poor site the board, 3) deficient contractual worker experience, are the most powerful factors. This paper has likewise broken down the normal and least effective of the postpone variables causing task deferral and cost overrun in Malaysia. It likewise infers that there are various measures as per the idea of deferring components to decrease the effect on task postponement and cost overruns in the development industry. There are significant factors in the control of time overrun that would be actual thought related to know and tackle in great impact to improvement rate which may additionally no capacity that be recovered. Thirty (30) massive development extensions in Malaysia were exceptional coping with time overrun at some stage in development. Out of 30 undertakings, 17 (56.67%) ventures had been introduced by using 1100 days' time overrun, 5 (16.67%) extensions in the middle of a hundred and one to 200 days, 5 (16.67%) ventures 201 to 300 days while three (10%) ventures have been deferred for timeframe over 300 days.

Keywords

Cost and Time Overruns, Delay Factors, Construction Industry, Projects Delay

1. Introduction

Construction delays are bound to occur in practically all undertakings because of the miscommunication between contractual workers, subcontractors, property proprietors. Much of the time, development undertakings are postponed on account of the wrong gauge of time and task cost that was at first introduced to the customers or venture proprietors. Postponements and cost overrun are the most widely diagnosed troubles inflicting prolong in the improvement of commercial enterprise in both created and developing nations [1]. An examination by uncovering that the vast majority of ventures had the cost invades from an example of 258 organizations crosswise over 20 nations and 5 landmasses around the globe. By and by, delays happen in each improvement challenge and the extent of these postponements differs essentially from challenge to extend and nation to the nation [2].

The development industry assumes a significant job in contributing to countrywide economic systems around the globe [3]. The development business likewise sways the pace of GDP and work of numerous nations, and hence, the development business is viewed as crucial for the monetary development of a nation [4], and proposed that the development exercises have turned into a huge market pointer since this industry delivers a larger number of items and expends a bigger number of materials than different ventures. The fee overrun is one of the basic problems and requires an excellent deal of research studies and investigation to restrict or minimize the postponement and less variety in spending graphs for future tasks. In a portion of the created nations, the fee overruns outcome could be increased number of actual and the results could be again surpassing 100% of the underlying undertaking evaluated [5]. The development business is one of the primary divisions to invigorate and give fixings to the improvement of a national economy. Subsequently, it is viewed as that the development has an extraordinary association and assumed huge jobs in the monetary development or reactivation in all nations.

2. Related Works and Literature Review

The construction industry is one of the most perplexing, divided enterprises alluded to as calendar and asset driven. In the development industry convenient fruition of venture is a significant foundation of undertaking achievement. Overrun of time is any deferral past the standard development plan. Limiting time and cost is the primary objective in dealing with a development venture. Be that as it may, time delay every now and again happens in all periods of a development venture and therefore builds undertaking complete length [6]. Seldom undertakings square measure finished on agenda [7]. This immediate provides real thought to manage improvement time as every day of postponement contributes plenty of financial gain that is not any longer genuinely recouped. Consequently, various investigations are LED to know the variables inflicting time invade. In the Republic of Indonesia [8] pondered poignant variables on thir-

ty-one building undertakings and discovered that the foremost nice factors inflicting time overrun square measure configuration changes, poor work profitability, poor transcription, and quality deficiencies. Through the same investigation of motives for time overruns in improvement extends in urban center [9] situated five chief reasons for deferrals inclusive of Poor website the executives. In Ghana, [10] viewed ground-water tasks and made public that proprietors, settlement or sand professionals positioned unhealthy temp the board, typically regular installment challenges from offices, material acquiring, unhealthy specialized exhibitions and acceleration of cloth fees as predominant issues that may purpose overrun of time. Likewise [11] indicated that the foremost important variables influencing improvement timetables had been financing and installment for finished works, negative agreement the board, modifications in online page conditions, lack of materials, and foolish transcription. As per [12] seventieth of things to try and do skilled time overrun, the regular time postpone tiers from 100% to half-hour of the primary period of the endeavor. Sudden website stipulations are situated the most clear purpose for timetable defer influencing all out-undertaking terms and value of endeavor [13].

Management got to be ascribed to own been typically flighty climate, growth in material value, misguided material's assessments, elaboration of venture, written agreement worker's absence of land understanding, transient worker's absence of venture sort involvement, and non-recognition with close pointers [14]. In addition, Morris documented 10 elements touching worth overruns in development ventures. These parts are poor mission arrangement, composition, and usage, lengthen in development, offer of crude cloth and hardware by means that of written agreement employee, alternate within the extent of the enterprise. Likewise, examine the aspects of touching development value invades on constructing ventures in the African nation [15]. The author discovered that worth overruns crop up all the additional many the time and are during this means a larger serious issue than time invades in the African nation.

2.1. Construction Life Cycle

The basic stages in the venture life cycle comprise four stages which are calculated arranging and practicality studies, structure and building, development, and activity and support. Other than that, the task life cycle can be characterized into five stages which are the attainability stage, plan stage, development stage, abuse stage and disassembling stage. The principal stage is the practicality stage which comprises the issues of affordable, security of laborers along with the development procedure, specialized viewpoints, and essential data for all stages in development (Figure 1).

2.2. Causes of Overruns

The author showed that a prominent foundation extends that experience cost and time issues or authoritative debates draw in media consideration as the network adds to financing their conveyance [16]. South Africa, has likewise

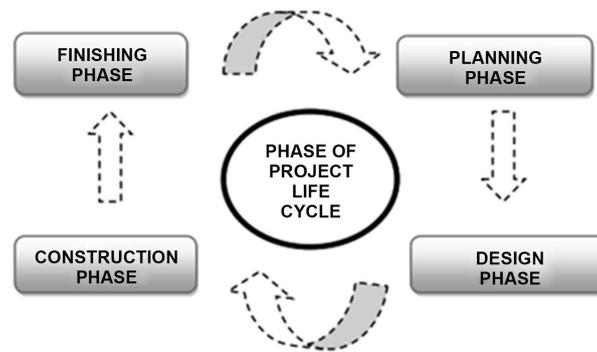


Figure 1. Project life cycle.

encountered some present-day high-quality charge invades in a very few good-sized scale ventures, fashions are the association soccer city area in metro-polis worked for R3, 3 billion and encountered a price overrun of fifty-eight [17]. Green point arena in the city center encountered a half value invade [18]. Author has stimulated that daily price overruns for groundwork duties will go between twenty. 4% for streets, 33.8% for extensions and burrows and 44.7% for rail [19], apparently, [20] document surely decrease ranges of common charge (Table 1).

2.3. Factors Affecting in Cost and Time Overrun

There are numerous factors that reason time and price invade in development. These aspects have been individual in previous investigations inclusive of a variety of nations. Malaysia [21], directed an overview of large reasons for lengthening in MARA the executive's acquisition development ventures. This investigation was found that the necessary defer causes are profits and cash related troubles looked via temporary workers, contractual workers' bad website the executives and incapable of arranging and reserving through brief workers.

Result suggests the essential ten noteworthy causes are debasement and pay off, political interests, terrible web page the board, delay in web site activation, inflexible demeanor via advisors, extra work without endorsements, visit changes at some stage in execution, gold plating, wellness and wellbeing and constrained get right of entry to locations of work. The author featured that the cost invades to be one in each of the sole difficulties in the execution section of the development venture [22]. In addition, expressed via suggests that [23], the distance of import invades is regularly a clarification for the frustration of a task. However, no longer all creators concur that the frustration is taken into account from one single issue then again a number of settle for their rectangular measure lots of matters inflicting the deferral. In any case, [24] supported those their rectangular measure three great measures to differentiate whether or not or not, the ventures square measure fruitful or not. Tasks have to be compelled to operate the utility, the executives of the challenge and execution of the written agreement employees inside the route of the procedure. Within the alternative hand,

Table 1. Factors causing time overruns.

| Category | Factors |
|---------------------------|--|
| Client | Money and installment of finished work, Client obstruction, Slow basic leadership by customers, Unrealistic forced agreement span |
| Contractor | Subcontractors, Site the board, Construction techniques, Improper arranging, Mistakes during development, Inadequate temporary worker experience |
| Consultant | Agreement the board, Preparation & endorsement of drawings, Quality affirmation/control, Waiting time for endorsement of reviews |
| Materials | Nature of material, Shortage in material |
| Labor and equipment | Work supply, Labor efficiency, Equipment accessibility what's more, disappointment |
| Contractual relationships | Significant questions and exchanges, Inappropriate hierarchical structure connecting parties, Lack of correspondence between the equalities |
| External factors | Climate condition, Regulatory changes and construction standard |

[25] encouraged that the strategy into a fruitful mission success and carry is real estimation, statement time execution, price execution and consequently the rife nature of the development venture.

3. Methodology

The essential motivation at the back of this vision was once to exchange the state into focused and dynamic versatile always 2020. As far back as the improvement of business division count on a big job due to the fact that this enterprise can provide higher dedication in countrywide economy and GDP development. Consequently, development enterprise ought to be effective as a long way as conveying task on time besides vitiating any misfortune and the commercial enterprise ought to function suitable, ultimately the United States of America should contend with different created nations on the planet with aspect of accomplishing the inventive and prescient and mission.

For this situation, the scientist has additionally utilized the Relative Importance Index (RII) strategy to distinguish their significance of causes and impact of deferring factors, which is likewise utilized [26]. The survey was sent to three gatherings (customers, advisors and contractual workers) who assume primary jobs in development ventures, where the scale is utilized extending from 1 is not significant and 5 significant. The (RII) was utilized to distinguish which causes are the most critical causes by positioning them into their RII significance esteems. The respondents took an interest in the study wherein ten were recognized as the best factors causing deferral and cost invades from the rundown of 20 [27]. The main 10 most significant elements, which found from the overview in Malaysia development industry, are as per the following:

- 1) Temporary worker's inappropriate arranging
- 2) Temporary worker's poor site the executives

- 3) Lacking contractual worker experience
- 4) Lacking customer's account and installments for finished work
- 5) Issues with subcontractors
- 6) Deficiency in material
- 7) Work supply
- 8) Gear accessibility and disappointment
- 9) Absence of correspondence between parties
- 10) Errors during the development arrange

Overrun Factors in Construction Life Cycle

The motive for this section is to get an everyday view about the factors of time and value overruns that took place in the improvement lifestyles cycle. As indicated by desk (2) beneath, there are 35 variables that were distinct from past investigations and these elements used to be separated into three instructions which are components add to time invaded, cost overrun, and time and cost invade. At that point, these factors were grouped into four degrees entails arranging, plan, development and wrapping up. Just two factors that happened along the development life cycle which comprises of the absence of correspondence among gatherings and change in the extent of the venture. In the mean-time, different variables have happened in various stages (**Table 2**).

The 30 elements were recorded and a pilot poll study and meetings were directed among three gatherings of master respondents for example customers (6 reacts), venture the executive's specialist (9 reacts) and brief worker (6 reacts) senior faculty (**Appendix A**). The grasp respondents were noted to rank from 1 to 30 as indicated by means of their conclusions in the positioning structure the place the littler numbers communicate to "higher importance" while the higher. Information assembled was investigated by way of figuring the regular of the score by way of using the recipe:

$$X = \frac{1}{n} \sum_{i=1}^n a_i \quad (1)$$

where,

X = mean arithmetic,

n = respondents' quantity,

a = respondents rating ($i = 1 \dots n$)

$$SS = \frac{Z^2 \times P \times (1 - P)}{C^2} \quad (2)$$

where SS = Sample size,

Z = Z charge (e.g. 1.96 for ninety fifth confidence level),

P = proportion selecting a selection, expressed as a decimal (0.50 used for pattern measuring needed), C = Margin of error (9%).

It suggests the degree of relationship existing between positioned parts of 2 worlds the essential procedure formula is

Table 2. Frequency of factors occurred in each phase.

| Phase | planning | Design | Construction | Finishing |
|-------|----------|--------|--------------|-----------|
| Total | 6 | 10 | 30 | 8 |

$$e = 1 - \frac{6 \sum_{i=1}^n d_i^2}{n(n^2 - 1)} \quad (3)$$

where d_i = the large big difference between the disbursed positions to x_i the rank assigned to Y_p , $I = 1, 2, \dots, n$ the instance size.

4. Result and Discussion

Organized poll summary structured on eighteen elements recovered from **Table 3** accustomed be directed among the varsity of Project Management Consultants (PMC). A total of forty-five poll sets had been disseminated and thirty-seven reactions were gotten that framed 82.22% of reactions. Aftereffects of gathered square measure talked regarding beneath.

Respondent Demographics

The Statistical description of respondents showed in **Table 4**. The outcomes show that solitary 7 of 30 respondents (18.9%) had working encounters of 6 to 10 years. Be that as it may, the greater part of respondents for example 30 of 37 (81.1%) respondents had working encounters over 10 years. This suggests respondents have sufficient experience to give dependable data relating time invade factors. As demonstrated in the table, a larger part (73%) of the respondents had gotten a degree in structural building, 5.4% with mechanical designing, 8.1% in electrical building and 13.5% other related control. This related control incorporates Quantity Surveyor, Architect and recognition affirmations. In terms of the task size dealt with by respondents, the outcomes show that the majority of the respondents experienced in taking care of enormous development ventures, for example, the agreement measure of task surpass RM 5 million [6].

Table 5 demonstrates that respondents positioned “Income and budgetary troubles looked by contractual people in the predominant role with mean role of 13.8. PMC accepts this problem is primary the place it would possibly influence special causes, for example, contractual people terrible website the executives, lack of website employees and insufficient arranging and booking. Settling this problem ought to settle extraordinary troubles at the same time. Different examinations have indicated that in standpoint on consultants’ income and money associated challenges of transient employee assume quintessential job in the time execution and deferral of venture, [2] learn about in Ghana referenced that temporary worker’s money associated troubles have been located as 0.33 and profits during development were positioned that fifth giant issue influencing improvement time.

Table 3. The top ten analysis responses by using all selected respondents.

| S. No. | Time Overrun Cause |
|--------|---|
| 1 | Practice of doling out agreement to least bidder |
| 2 | Temporary worker's poor site the executives |
| 3 | Income and money related troubles looked by contractual workers |
| 4 | Inadequate arranging and planning by temporary workers |
| 5 | Issues with subcontractors |
| 6 | Deficient contractual worker experience |
| 7 | Material obtainment |
| 8 | Poor gauge venture length |
| 9 | Inept architects |
| 10 | Deficiency of site laborers |
| 11 | Absence of correspondence among parties |
| 12 | Unanticipated ground condition |
| 13 | Changes in extent of ventures |
| 14 | Low speed of basic leadership |
| 15 | Regular changes by proprietors |
| 16 | Heightening of material costs |
| 17 | Proprietor obstruction |
| 18 | Change the board |

Table 4. Respondents demographic.

| | Frequency | Percent | Cumulative Percent |
|---------------------------|-----------|---------|--------------------|
| Experiences | | | |
| 6 - 10 Years | 7 | 18.9 | 18.9 |
| Above 10 Years | 30 | 81.1 | 100 |
| Respondent Specialization | | | |
| Civil Engineering | 27 | 73.0 | 73.0 |
| Mechanical Engineering | 2 | 5.4 | 78.4 |
| Electrical Engineering | 3 | 8.1 | 86.5 |
| Other | 5 | 13.5 | 100 |
| Project Size | | | |
| 10 - 50 Million | 5 | 13.5 | 13.5 |
| Above 50 Million | 32 | 86.5 | 100 |

5. Conclusion

By utilizing the past examination, this investigation can distinguish the elements that happen in each period of the venture life cycle. In large setting, just two components happened in all stages. Among these elements is the absence of

Table 5. Time overrun ranking cause by PMC.

| Cause of Time Overrun | Mean Rank | Rank |
|---|-----------|------|
| Income and money related troubles looked by temporary workers | 13.8 | 1 |
| Contractual worker's poor site the board | 12.74 | 2 |
| Insufficient contractual worker experience | 12.61 | 3 |
| Lack of site laborers | 12.36 | 4 |
| Insufficient arranging and booking by temporary workers | 12.18 | 5 |
| Acceleration of material costs | 11.27 | 6 |
| Practice of appointing agreement to most reduced bidder subcontractors Issues | 11.01 | 7 |
| Absence of correspondence among parties | 10.47 | 8 |
| Change the board | 10.32 | 9 |
| Late in material acquirement | 9.69 | 10 |
| Awkward fashioners | 9.66 | 11 |
| Poor gauge venture span | 9.46 | 12 |
| Low speed of basic leadership | 8.07 | 13 |
| Unanticipated ground condition | 6.11 | 14 |
| Changes in extent of ventures during development work | 6 | 15 |
| Successive structure changes | 5.93 | 16 |
| Proprietor impedance in development work/process | 5 | 17 |
| | 4.31 | 18 |

correspondence among gatherings and change in the extent of the undertaking. From these outcomes, once more, it is noticed that development stage is a significant benefactor on schedule and cost invade in development venture. The discoveries could assist the professionals with gaining better comprehension about the components impacting on schedule and cost along development venture.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Appendix A. List of project facing time overrun.

| No. | Project Name | Cost of Project (Million RM) | Duration of Project (days) | Overrun of Time (Days) | %Time Overrun |
|-------------------------|---|---------------------------------|-------------------------------|---------------------------|------------------|
| PERAK State | | | | | |
| 1 | MRSM Kroh Construction, | 33.6 | 504 | 335 | 66.47 |
| 2 | MRSM Kuala Kangsar Construction, Perak | 40.3 | 545 | 4 | 0.73 |
| 3 | Enlarge/Upgrade of IKM Lumut, Perak | 11.2 | 700 | 35 | 5 |
| 4 | KKTM Lenggong Construction, Perak | 113.3 | 791 | 21 | 2.65 |
| 5 | Development Winh System Fixing, MIMET | 1.3 | 265 | 68 | 25.66 |
| SELANGOR State | | | | | |
| 6 | MRSM Construction, Tanjung Karang, Selangor | 47.9 | 503 | 326 | 64.81 |
| 7 | Latest GMI field Construction | 333.2 | 910 | 7 | 0.77 |
| 8 | MFI field Enlargement, Bangi | 13 | 545 | 194 | 35.6 |
| 9 | MSI attachment workshop Construction, Kulim | 1.8 | 168 | 76 | 45.24 |
| 10 | FDRC at Fitec Construction | 1.6 | 84 | 2 | 2.38 |
| PAHANG State | | | | | |
| 11 | MRSM Construction, Pekan, Pahang | 48.5 | 671 | 153 | 22.8 |
| 12 | MRSM Construction, Bentong, Pahang | 55 | 504 | 76 | 15.08 |
| 13 | MRSM Upgrading, Kuala Lipis | 3.6 | 349 | 4 | 1.15 |
| 14 | KKTM Kuantan, Pahang Construction | 66.4 | 728 | 256 | 35.16 |
| TERENGGANU State | | | | | |
| 15 | MRSM Kuala Terengganu Upgrade | 2.8 | 279 | 332 | 119 |
| 16 | IKM Kemaman, Terengganu Construction | 67 | 713 | 18 | 2.52 |
| 17 | Construction of one Unit PMN Banglo, Terengganu | 0.3 | 219 | 84 | 38.36 |
| Territory State | | | | | |
| 18 | MRSM Betong, Sarawak Construction | 42.6 | 728 | 34 | 4.67 |
| 19 | MRSM Mukah, Sarawak Construction | 48 | 727 | 203 | 27.92 |
| 20 | NEGERI SEMBILAN State | | | | |
| 21 | Upgrade of MRSM Kuala Klawang, Negeri Sembilan | 13.0 | 909 | 66 | 7.26 |
| KELANTAN State | | | | | |
| 22 | MRSM Tumpat, Kelantan Construction | 48.7 | 538 | 127 | 23.61 |
| PERLIS State | | | | | |
| 23 | MRSM Arau, Perlis Construction | 38.6 | 727 | 241 | 33.15 |
| Sabah State | | | | | |
| 24 | MRSM Sandakan, Sabah Construction | 87.5 | 700 | 31 | 4.43 |
| MELAKA State | | | | | |
| 26 | Enlargement/Upgrade of IKM Jasin, Melaka | 47 | 364 | 138 | 37.91 |
| 27 | Kolej Professional MARA Tiang Dua Construction | 29.8 | 504 | 213 | 42.26 |
| JOHOR State | | | | | |
| 28 | IKM Sri Gading, Johor Construction | 72.9 | 511 | 273 | 53.42 |
| 29 | IKM Johor Bharu, Johor Enlargement | 9.4 | 413 | 263 | 63.68 |
| 30 | IKM Muar, Johor Construction | 64.3 | 728 | 55 | 7.55 |
| | Min. Time Overrun | | | two days | |
| | Max. Time Overrun | | | 335 days | |
| | Avg. Time Overrun | | | 23.74 percentage (%) | |